OPERATION AND SERVICE MANUAL

GRAPHIC RECORDERS

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ASC-802
ASC-809

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About This Manual

This manual contains all of the necessary information needed to setup, operate and maintain your ASC-802 and ASC-809 signal conditioner. The manual is divided into the following chapters and appendixes:

- Chapter 1, "Installation and Setup," lists the steps necessary to install your conditioner into a recorder or signal conditioner card cage. It also lists the appropriate signal input pin connections for your signal conditioner.

- Chapter 2, "Operation," explains the operation of the ASC-802 conditioner. Since the ASC-809 is similar to the ASC-802 this conditioner is simply highlighted at the end of the chapter.

- Chapter 3, "Maintenance," explains how to replace the user accessible parts of your signal conditioner. This chapter also lists the steps necessary to calibrate your signal conditioner.

- Appendix A lists replaceable parts for each conditioner.
- Appendix B includes various schematic and assembly drawings for the conditioners.

Note:

Since the ASC-801 is an earlier version of the ASC-802, this manual may be used to support the ASC-801 signal conditioner. The ASC-801 operates and calibrates like the ASC-802 minus the peak-to-peak/root mean square switch.

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Chapter 1: Setup and Installation

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Conditioner Installation

HINT: Depending upon your application, you may wish to set the switch(es) located on the right panel of the conditioner before you lock the conditioner into place. See "Operation."

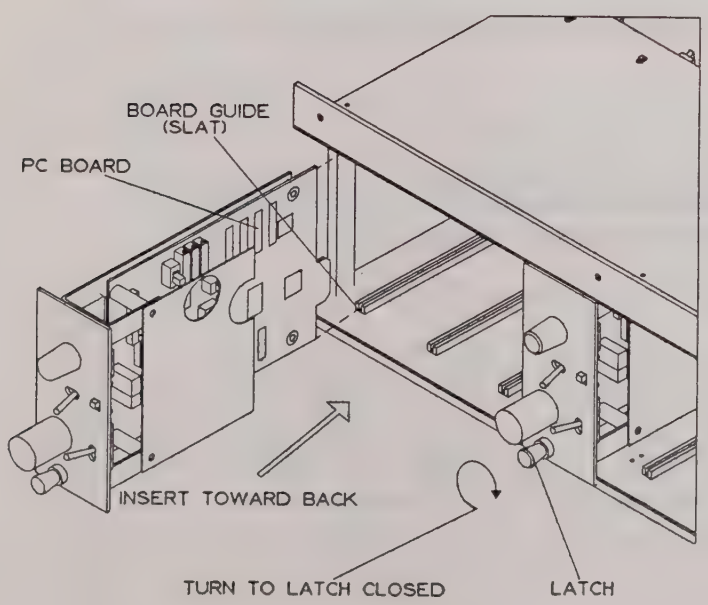
1. Turn the latch, on the bottom of your signal conditioner, counterclockwise until it is fully loosened.

2. Align the signal conditioner with the signal conditioner chamber so the PC board is partially inserted within the board guides (white slats) which line the wall of the signal conditioner chamber.

3. Carefully slide the conditioner into the chamber until it clicks into place.

Do not force the conditioner into place. If the conditioner doesn't slide into place easily, remove it from the chamber and realign it within the board guides.

4. Turn the latch fully clockwise to lock the conditioner into place.



CAUTION: Never insert or remove the signal conditioner by pushing or pulling on its 10-turn potentiometer as it may break. Use the latch to firmly slide the conditioner in and out of its chamber.

Pin Connections

The following tables and their corresponding illustrations outline the signal input pin connections for the ASC-802 and ASC-809. As illustrated, these connections differ with the type of recorder used.

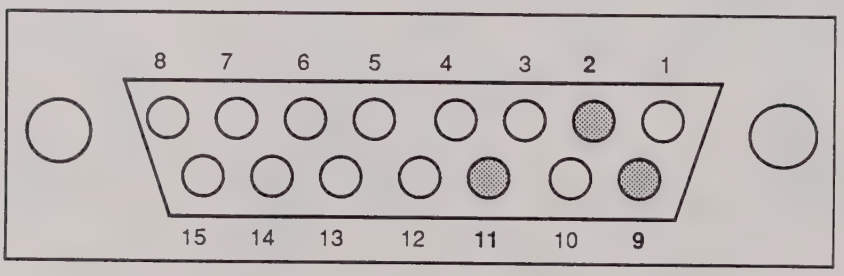
PIN TABLE

(FOR DASH II+ AND MT-8500)

DESCRIPTION	PIN #
SIGNAL -	2
SIGNAL +	9
COMMON	11

D-SHELL SOCKET HOUSING

(FOR DASH II+ AND MT-8500)



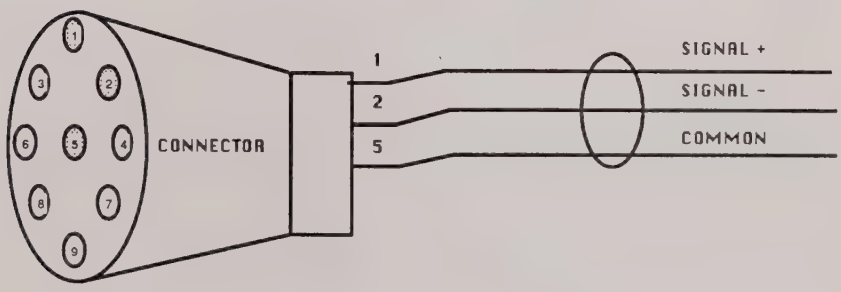
PIN TABLE

(FOR ZF-6000 AND ZF-8000)

DESCRIPTION	PIN #
SIGNAL -	2
SIGNAL +	1
COMMON	5

CIRCULAR 9-SOCKET HOUSING

(FOR ZF-6000 AND ZF-8000)



Notes:

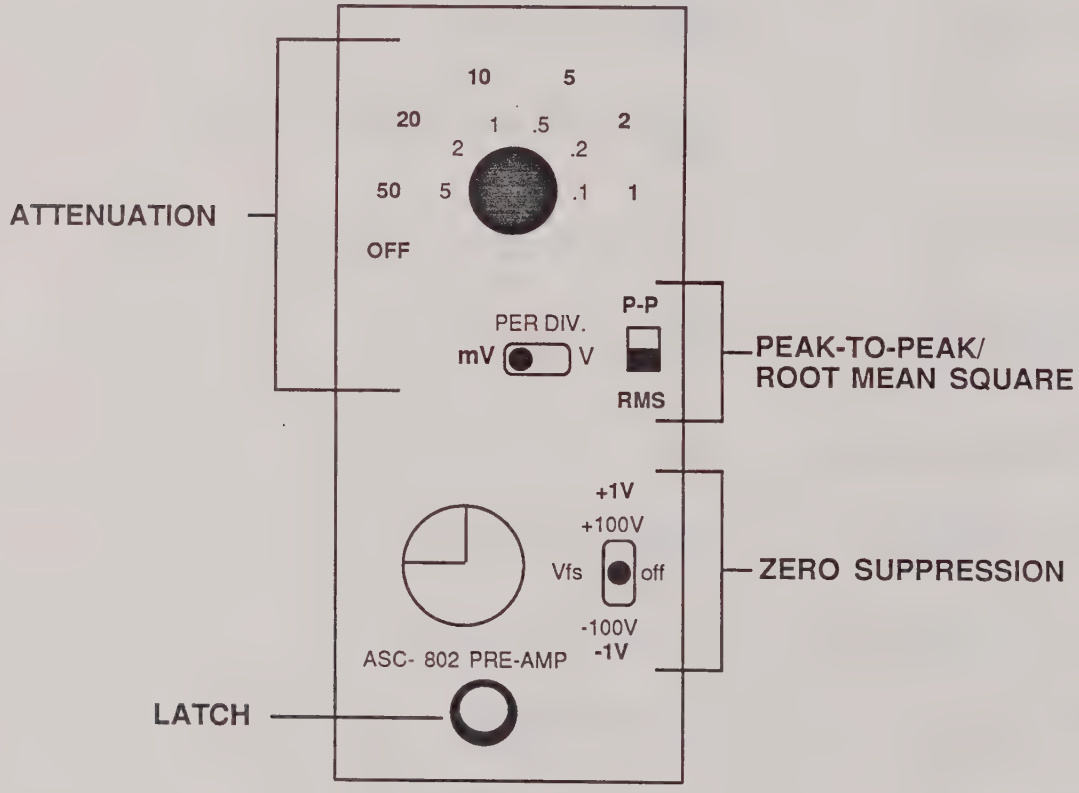
Chapter 2: Operation

ASC-802 Specifications

Range	1 mV/div. to 250 V full scale, calibrated
Maximum Input	250 VDC or peak-to-peak AC
Attenuator	13 Steps: 1, 2, 5, 10, 20, 50 and mV/div.; .1, .2, .5, 1, 2, 5 V/div. and "off"
Input Mode	RMS or peak-to-peak
Positive Signal Input	Deflects left or right via board mounted switch
Input Coupling	AC or DC via board-mounted switch
Common Mode Rejection	80 db at 60 Hz
Common Mode Voltage	500 V
Input Impedance	2 megohms, differential
Frequency Response	< 3 db down at 6 kHz
Non-Linearity	± 0.1% of full scale
Low Pass Filter	10 Hz, switch selectable
Zero Suppression	± 1 V and ± 100 V, switch selectable and continuously variable between ranges
Calibration	Factory set

ASC-802 Operation

The ASC-802 uses attenuation and zero suppression systems to scale a range of signals from 50 millivolts to 250 volts for up to 50 divisions full scale. A peak-to-peak/root mean square switch offers you the option of charting the signal as it is actually input into the system or converting it to its root mean square level.



Attenuation

The attenuation controls, in the upper half of the conditioner, enable you to determine the number of volts or millivolts printed per division on the chart paper. This section consists of two controls: an attenuator knob and scale switch.

The **scale switch** relays the scale of the incoming signal to the signal conditioner. This switch contains two settings: **"mV"** orange and **"V"** (white).

The **attenuator knob** determines the signal sensitivity (number of millivolts or volts per chart division). There are usually 50 divisions per channel. Both the millivolt scale (orange) and the volt scale (white) have 6 sensitivity settings. The **mV** settings include: **"1," "2," "5," "10," "20," "50"** and **"off"** and the **V** settings include: **".1," ".2," ".5," "1," "2,"** and **"5."**

To determine the scale and signal sensitivity:

1. Set the scale switch to match the incoming signal, "mV" or "V".

2. Divide the waveform amplitude by the number of divisions to find the signal sensitivity.

3. Rotate the attenuator switch to this division number.

NOTE: If you do not know the amplitude of the incoming waveform, position these controls on their least sensitive settings and gradually shift them to their most sensitive settings to dial in the waveform.

Let's assume, for example, the full scale amplitude of your waveform is 100 volts. Set the scale switch to the "V" position. Then divide 100 by 50 (the most common number of divisions) to arrive at 2 volts per division and set the attenuator knob accordingly.

Zero Suppression

The zero suppression controls, on the bottom half of the conditioner, facilitate waveform recording by permitting you to shift the zero point (even off the chart). This section consists of two controls, a polarity switch and a 10-turn potentiometer.

The **zero suppression polarity switch** determines which direction the zero moves. Setting the switch in the **"+"** position shifts the zero point to the left side of the chart and setting the switch in the **"-"** position shifts the zero to the right side of the chart. Shifting this switch **"off"** shuts down the entire zero suppression mechanism.

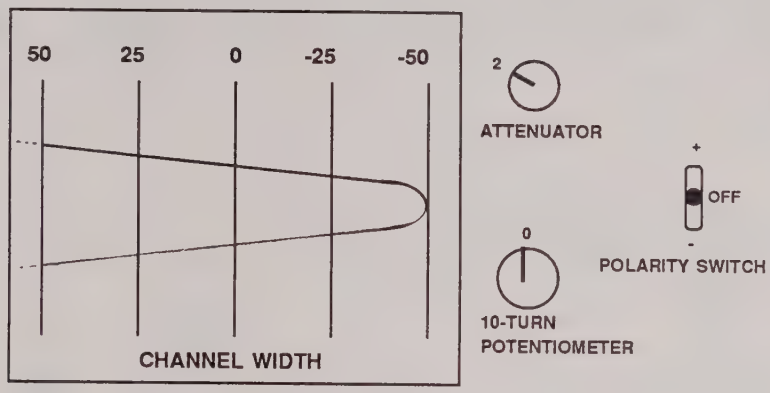
The **10-turn potentiometer** determines how far the zero moves, thus determining the new baseline value.

To shift the zero point:

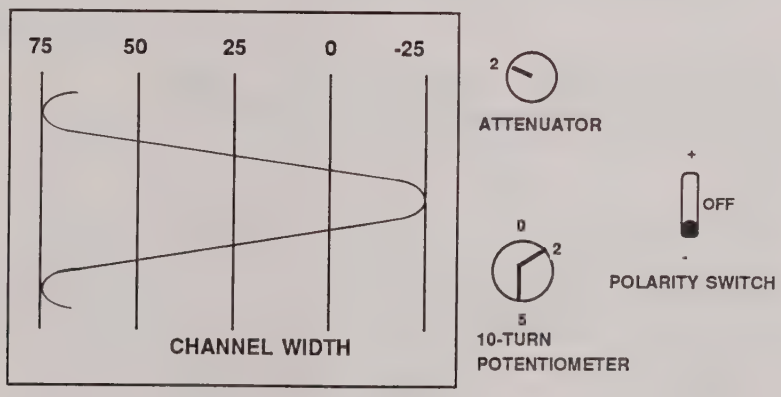
1. Set the polarity switch to "+" or "-" to determine the direction of the shift.

2. Set the 10-turn potentiometer to the number of divisions that you wish to shift the baseline.

You may, for example, be recording a waveform with a 100 volt amplitude and a range of -25 to 75 volts. When the recorder is printing within a range of -50 to 50 volts the top 25 volts of waveform amplitude can not be seen.



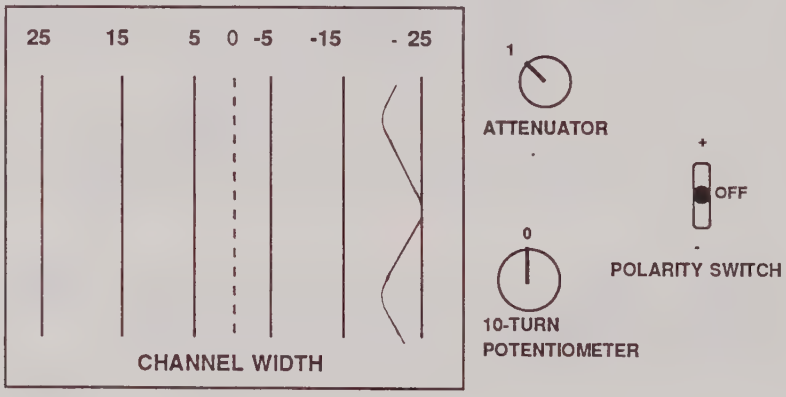
Set the polarity switch to the "-" position and rotate the 10-turn potentiometer until it reads "25" to shift the baseline 25 divisions.



Attenuation and Zero Suppression

The attenuation and zero suppression controls may be used in combination to expand or compress a particular waveform.

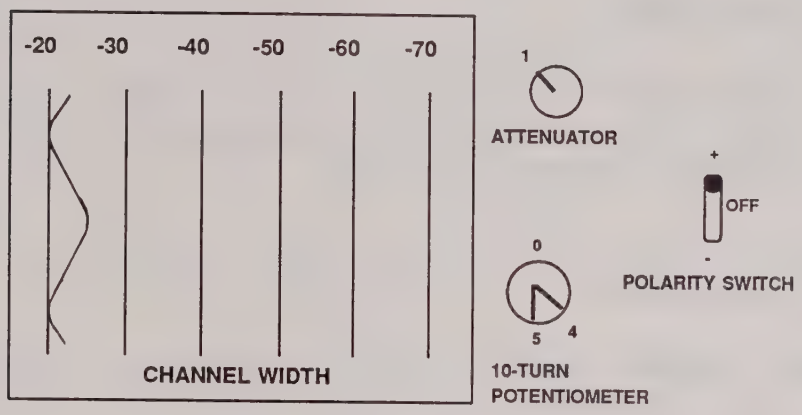
You may, for example, be recording a 5 volt waveform (from -20 to -25) within a range of -25 to 25 volts. (The attenuator is set at 1 volt per division.)



Since studying an entire waveform the width of 5 divisions is cumbersome, you may wish to magnify the waveform.

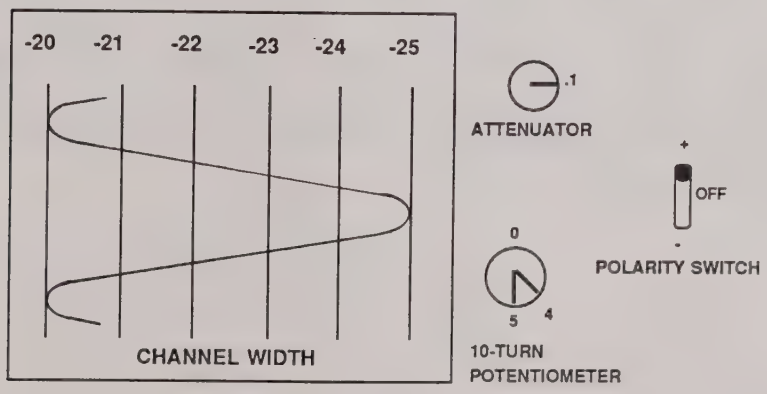
1. Shift the zero off the left side of the chart by setting the polarity switch to the "+" position.

2. Rotate the 10-turn potentiometer 4.5 turns to shift the baseline 45 divisions and set -20 volts as the new baseline value.



3. Change the attenuator from 1 to .1 volts per division to expand the waveform by a factor of 10.

Once magnified, the waveform fills the chart.



Peak-to-Peak/Root Mean Square

Either set the switch to **"P-P"** to record the actual signal as it is input or **"RMS"** to convert the signal to the root mean square level and record it as a full scale representation, depending upon the attenuation.

Low Pass Filter

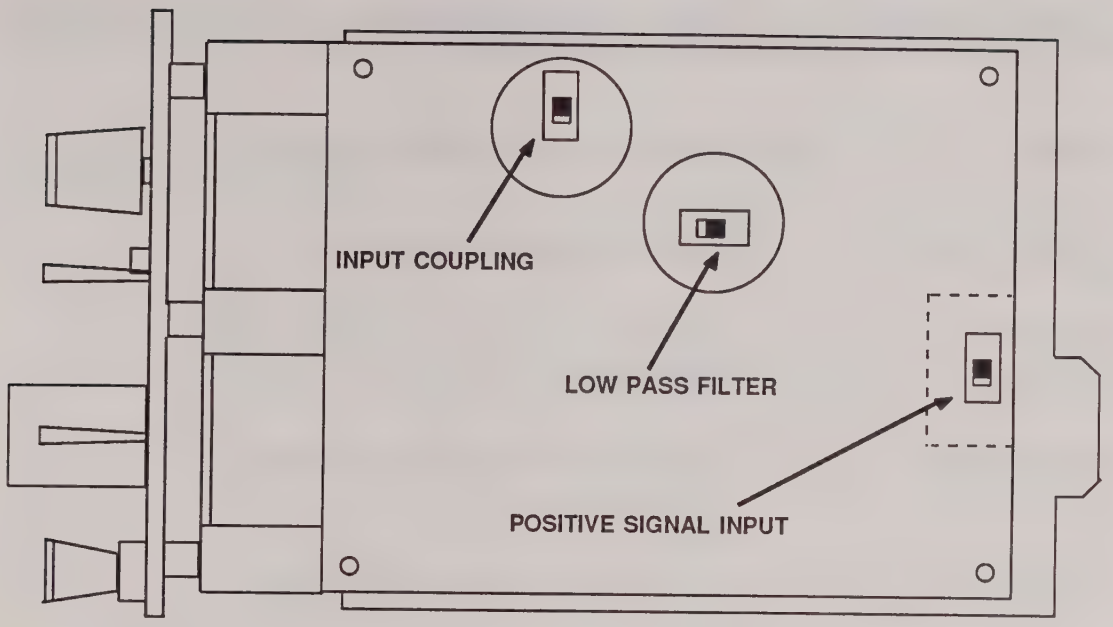
The **low pass filter switch** is on the PC board, beneath the right access hole. This low pass filter may be switched "**in**" to eliminate high frequency, full amplitude signals above 10 Hz.

Input Coupling

The **input coupling switch** is on the PC board, beneath the left access hole. This switch may be set to **"AC"** to remove a large or fluctuating DC offset.

Signal Deflection

The **positive signal input switch** is located on the PC board, beneath the right side panel. This switch enables you to choose the direction, right or left, of the waveform deflection. This switch operates in a reverse manner if a negative signal is input: positive signal right becomes negative signal left and positive signal left becomes negative signal right. The positive signal input switch has no affect on the zero suppression polarity switch.


INPUT COUPLING
LOW PASS FILTER
POSITIVE SIGNAL INPUT

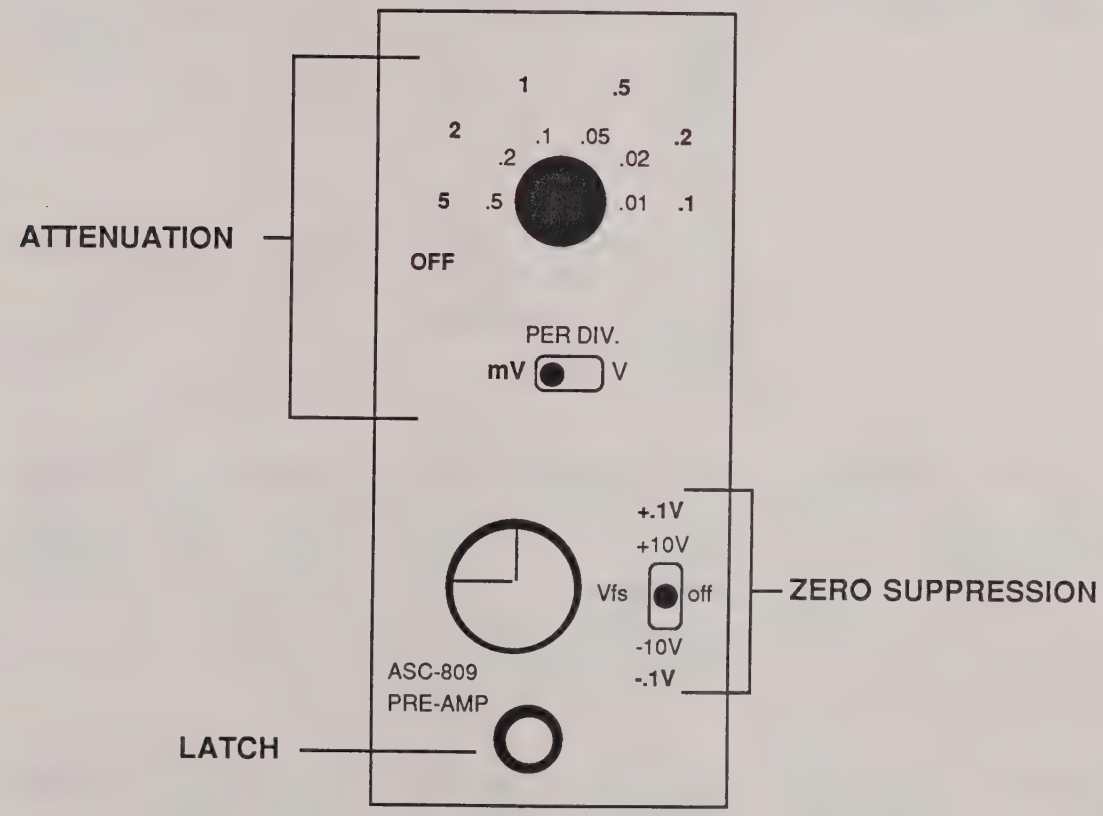
ASC-809 Specifications

Range	0.1 mV/div. to 25 V full scale, calibrated
Maximum Input	25 VDC or peak-to-peak AC
Attenuator	13 Steps: 0.1, 0.2, 0.5, 1, 2, 5 and mV/div.; .01, .02, .05, .1, .2, .5 V/div. and "off"
Positive signal Input	Deflects left or right via board mounted switch
Input Coupling	AC or DC via board-mounted switch
Common Mode Rejection	80 db at 60 Hz
Common Mode Voltage	50 V
Input Impedance	2 megohms, differential
Frequency Response	< 3 db down at 6 kHz
Non-Linearity	± 0.1% of full scale
Low Pass Filter	10 Hz, switch selectable
Zero Suppression	± 0.1 V and ± 10 V, switch selectable and continuously variable between ranges
Calibration	Factory set

ASC-809 Operation

As noted, the ASC-809 operates in the same manner as the ASC-802 with a few minor exceptions:

- Signal range (see "ASC-809 Specifications" for further range and input details)
- ASC-809 doesn't have a peak-to-peak/root mean square switch



In Case of Difficulty

This section is provided to assist you in diagnosing and correcting simple problems caused by inaccurate signal conditioner adjustment. Call our Customer Service Department at (401) 828-4000 if problems persist.

Difficulty	Probable Cause	Solution
The signal is clipped or pegs off the chart.	The incoming signal is too high for the signal range (sensitivity) selected by the scale or attenuator switch.	Gradually increase the signal sensitivity one increment at a time.
	The polarity switch is "on" and the 10-turn potentiometer is rotated off "0."	Reduce or eliminate the zero suppression.
A full amplitude signal is smaller than it should be.	The incoming signal is too low for the signal range (sensitivity) selected by the scale or attenuator switch.	Gradually decrease the signal sensitivity one increment at a time.
A slowly moving DC level waveform remains just on the baseline.	The AC coupling switch is set to "AC."	Set the AC coupling switch to "DC."

Difficulty	Probable Cause	Solution
The waveform drifts slightly.	The zero suppression polarity switch is "on" and the 10-turn potentiometer is set slightly off "0."	Eliminate the zero suppression.
The signal is flat.	The peak-to-peak/ root mean square switch is set to "RMS."	Set the peak-to-peak/root mean square switch to "P-P."

Notes:

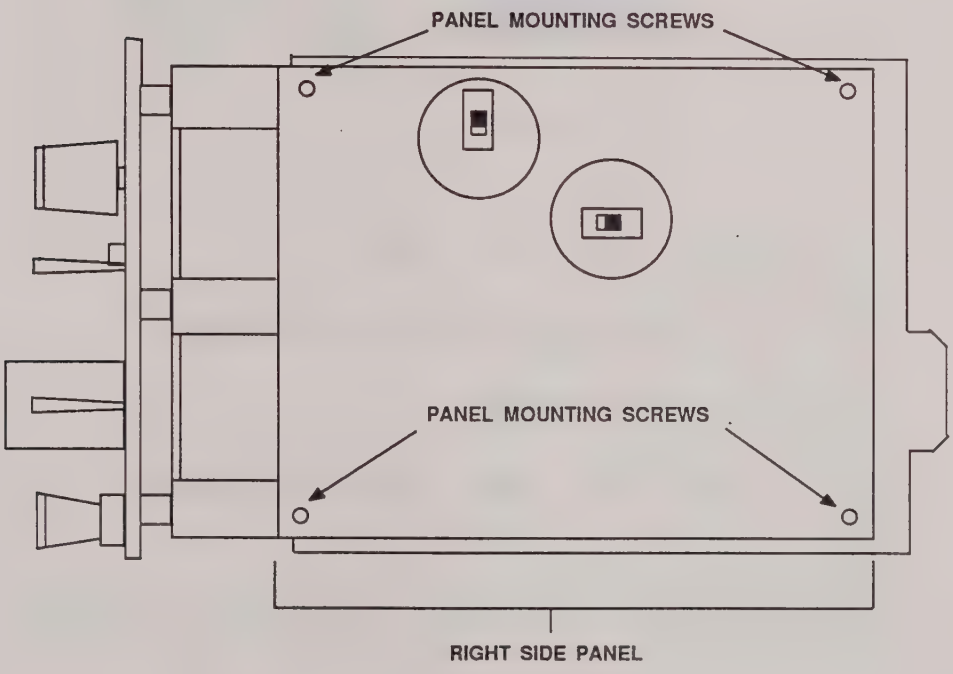
Chapter 3: Maintenance

Replacement of Parts

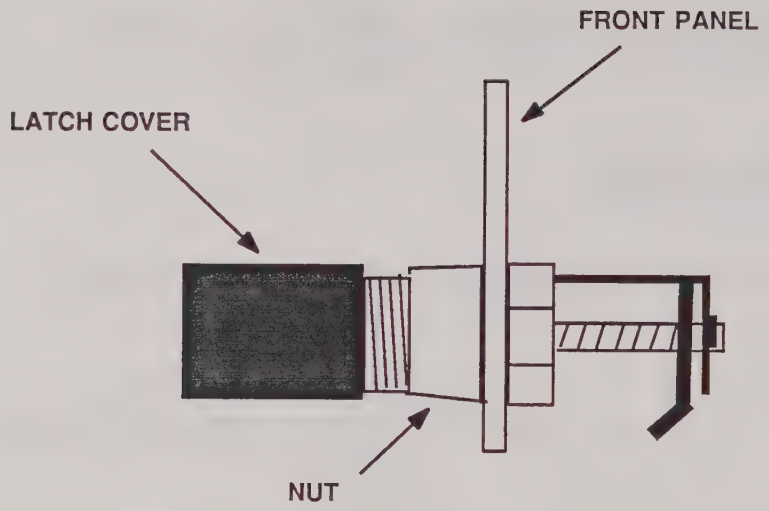
See "Appendix A: Replaceable Parts" for a complete list of all the replaceable parts and their corresponding order numbers.

Right Side Panel

1. Remove the four mounting screws and lift away the panel.



Latch

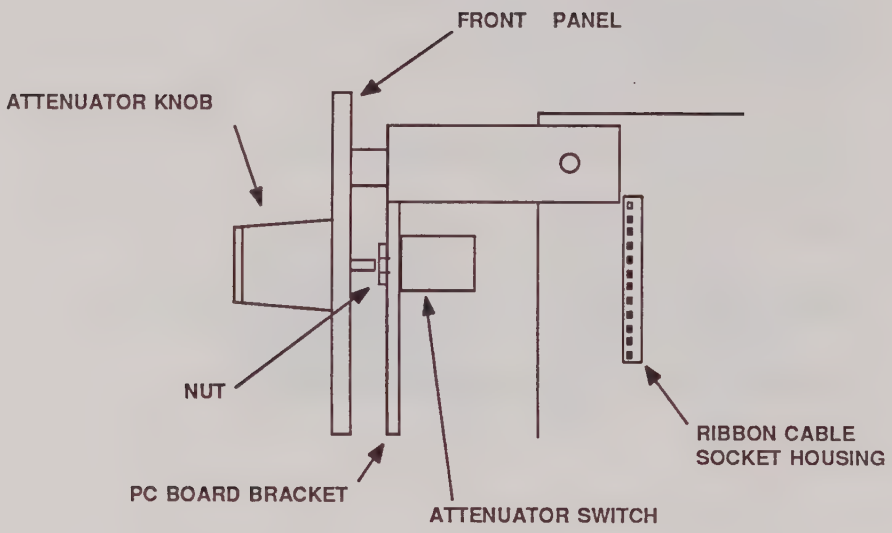


1. Turn the latch counterclockwise to loosen it.
2. Pull the black knob cover straight off the front of the knob.
3. Remove the nut from the fixture.
4. Pull the entire latch back through the opening in the front panel.
5. Follow the opposite of these instructions in descending order to install a new latch.

Attenuator Knob

1. Remove the cap from the attenuator knob.
2. Turn the knob counterclockwise until it is set to "off."
3. Loosen the screw that was covered by the cap.
4. Pull the knob straight off the front of the panel.
5. Place an attenuator knob onto the spindle so it is set to "off."
6. Tighten the knob into place and return its cap.

Attenuator Switch



1. Remove the right panel.

2. Remove the attenuator knob.

3. Loosen the nut that lies between the front panel and the PC board bracket.

   HINT: You may need to loosen the four screws that attach the front panel to the signal conditioner to give you more working space.

4. Pull the attenuator switch back through the hole in the PC board bracket.

5. Gently remove the ribbon cable from the ribbon cable socket housing.

6. Insert a new attenuator switch into the hole in the PC board bracket.

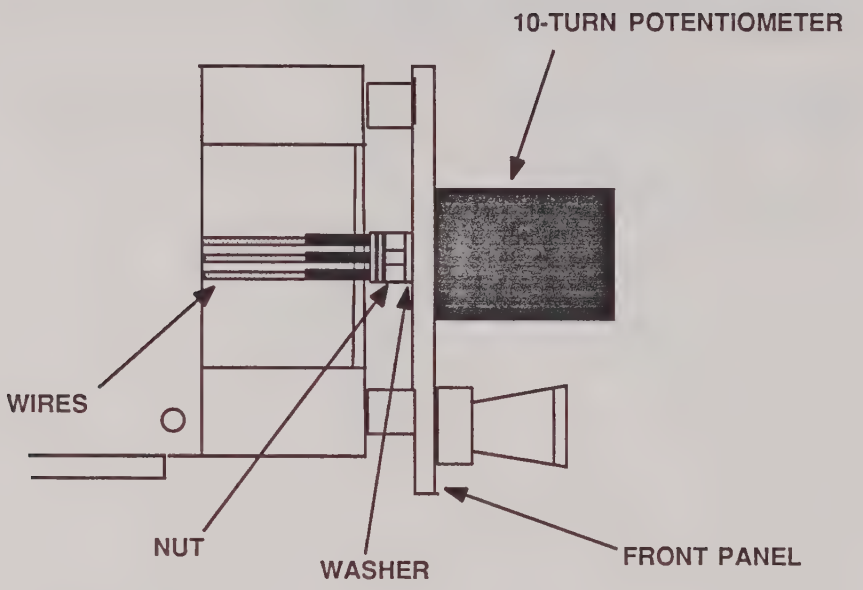
7. Use the nut to lock the switch into place.

8. Carefully insert the ribbon cable into the bottom most eleven (11) holes of the ribbon cable socket housing.

9. Replace the attenuator knob.

10. Replace the right panel.

10-Turn Potentiometer



1. Turn the signal conditioner so the left side panel is facing you.

2. Desolder the connections that lie between the 10-turn potentiometer and its wires.

3. Remove the nut and washer that hold the 10-turn potentiometer into place.

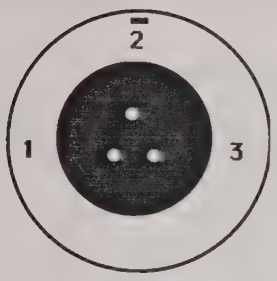
4. Pull the 10-turn potentiometer straight out the front of the conditioner.

5. Place a 10-turn potentiometer into the mounting holes on the front panel of the conditioner.

6. Replace the washer and nut.

7. Solder the wires as illustrated on the next page:

TOP

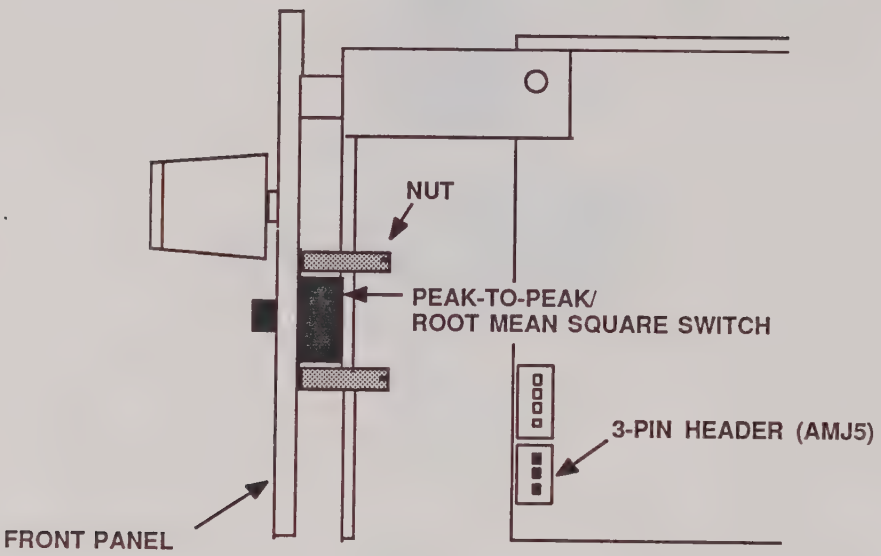


1 = BLACK

2 = ORANGE

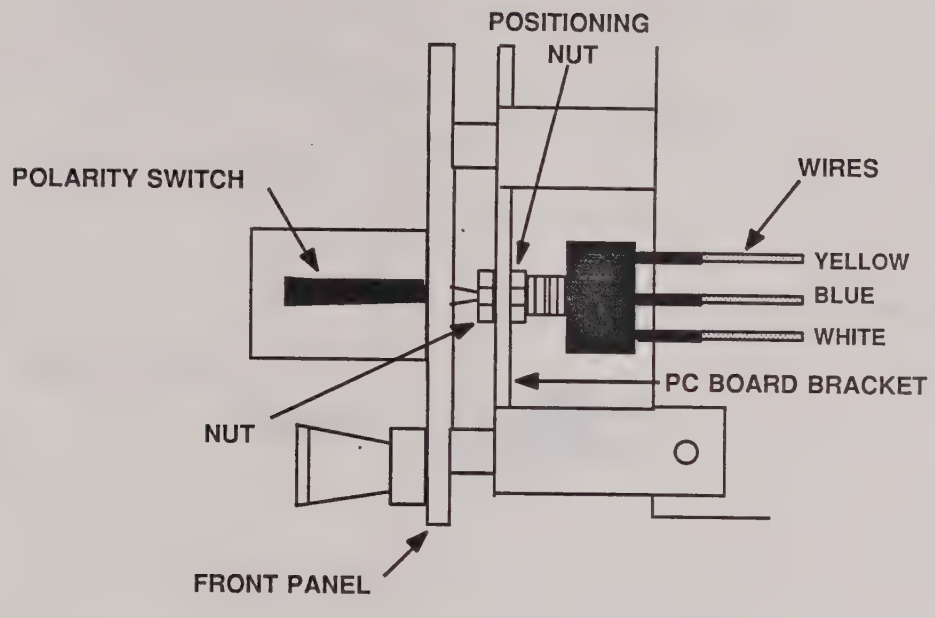
3 = BLUE

Peak-to-Peak/Root Mean Square



1. Remove the right panel.
2. Remove the two nuts that hold the switch in place.
3. Pull the switch back through its opening in the front panel.
4. Detach the 3-pin connector (AMJ5) from its header on the PC board.
5. Insert a new 3-pin connector into the header so that the mark AMJ5 is facing the front of the conditioner.
6. Place the switch into its opening in the front panel.
7. Replace the two mounting nuts.
8. Replace the right panel.

Polarity Switch



1. Loosen the nut that lies between the front panel and PC board bracket.

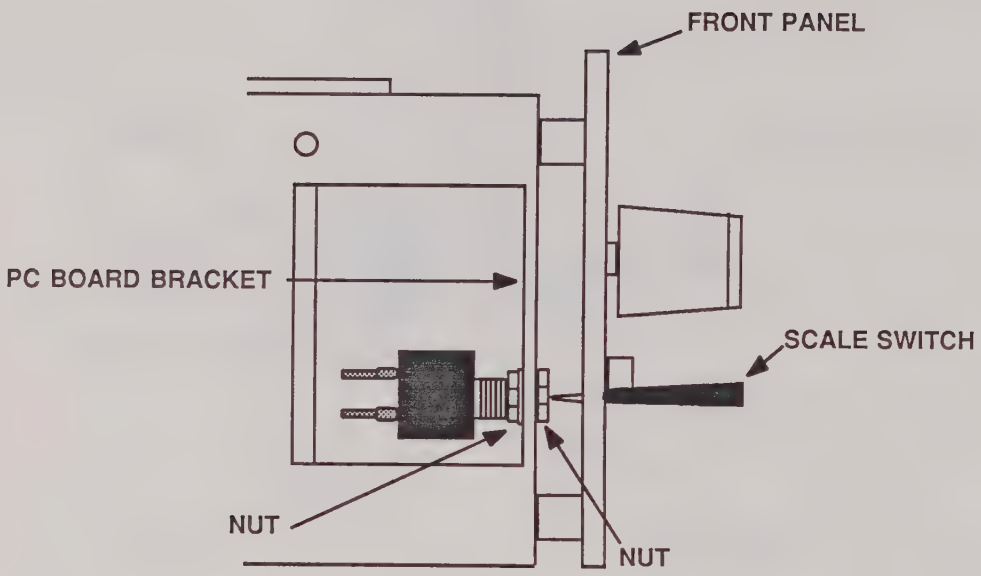
2. Slide the polarity switch back through its opening in the front panel.

3. Desolder the yellow, blue, and white wires at the rear of the polarity switch.

4. Remove the positioning nut.

5. Follow the opposite of these instructions in descending order to install a new polarity switch.

Scale Switch



1. Remove the right panel.
2. Gently remove the ribbon cable from the ribbon cable socket housing.
3. Position the signal conditioner so the left side panel is facing you.
4. Loosen the nut that lies behind the PC board bracket.
5. Remove the nut that lies between the front panel and PC board bracket.
6. Slide the polarity switch back through its opening in the front panel.
7. Replace the two mounting nuts.
8. Insert a new polarity switch into its opening in the front panel.

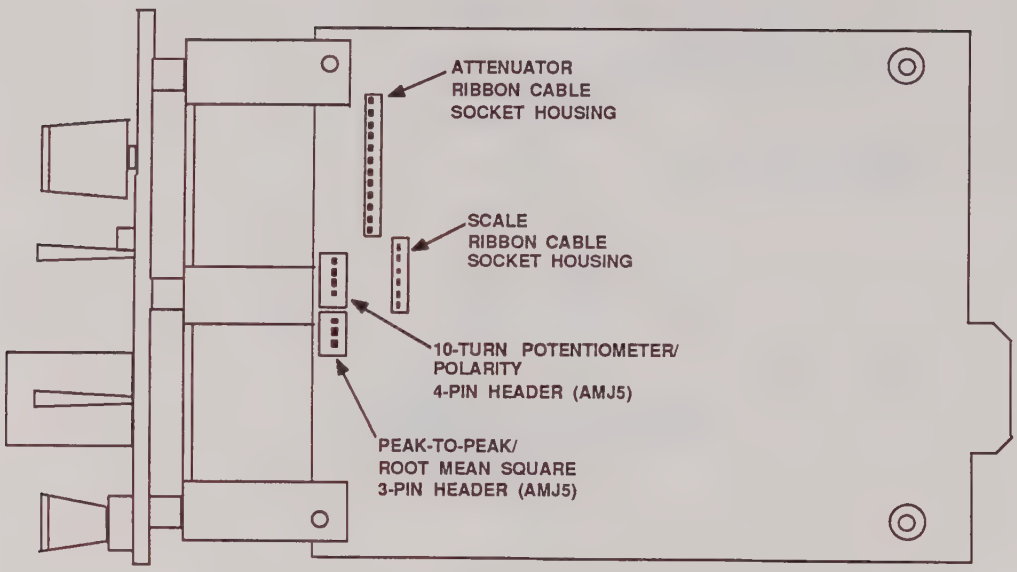
9. Tighten the two mounting nuts.

10. Position the conditioner so the PC board is facing toward you.

11. Gently attach the ribbon cable to its socket housing.

12. Replace the right panel.

PC Board



1. Remove the right panel.

2. Detach the the following ribbon cables and connectors:

- attenuator
- scale
- peak-to-peak/root mean square (3-pin)
- 10-turn potentiometer/polarity (4-pin)

3. Remove the four mounting screws that hold the PC board to the PC board bracket (left panel).

CAUTION: Do not mix the four standoffs together. The standoffs which support the rear side of the board are a fraction of an inch longer than those which support the left.

4. Remove the spacers and standoffs.

5. Connect an inside corner of the PC board bracket to one spacer and the same inside corner of the new PC board.

6. Attach a stand off to this assembly.

7. Repeat steps 5 + 6 for each corner.

8. Detach the the following ribbon cables and connectors:

   - attenuator
   - scale
   - peak-to-peak/root mean square (3-pin) (the letters AMJ5 face the front of the conditioner)
   - 10-turn potentiometer/polarity (4-pin) (the letters AMJ5 face the front of the conditioner)

9. Replace the right panel.

10. Calibrate the unit. (see "calibration" within this chapter)

Front Panel

1. Remove the right panel.

2. Remove the attenuator knob and 10-turn potentiometer.

3. Detach the peak-to-peak/root mean square switch from the front panel.

4. Remove the 4 front panel mounting screws from the rear side of the front panel. (you may need to remove the PC board to do this)

5. Pull the front panel straight off the conditioner.

6. Remove the latch.

7. Follow the opposite of these instructions in descending order to install a new front panel.

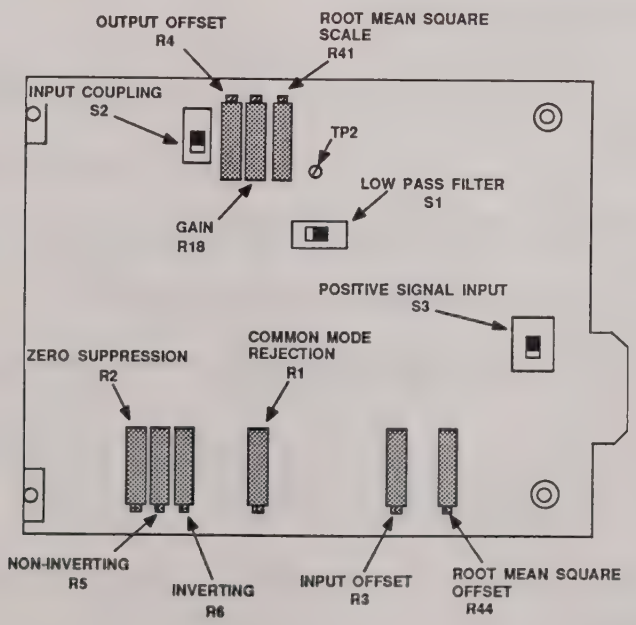
Calibration

The following procedure is applicable for both the ASC-802 and ASC-809 signal conditioners.

Equipment Needed

- 40 Hz signal generator with 2 VAC signal output for the ASC-802 or 200 mV AC for the ASC-809
- 4 (or more) digit Multimeter
- ASC-802/ASC-809 calibration box (see schematic for assembly instructions) (works for ASC-801, 802, and 809)
- Oscilloscope
- microvolt/millivolt source (only for ASC-802)

Calibration Points



General Setup

1. Remove the right panel. (see "Replacement of Parts" within this chapter)

2. Plug the signal conditioner into the connector on the test box.

3. Plug the test box into your AC power source.

NOTE: Steps 4-6 refer to the PC board.

4. Set the input coupling switch (S2) to "DC." (only for ASC-802)

5. Set the low pass filter switch (S1) to "out."

6. Set the positive signal input switch (S3) to "pos. right."

NOTE: Steps 7-11 refer to the front panel of the signal conditioner.

7. Set the polarity switch to "off."

8. Set the scale switch to "mV" per division.

9. Turn the attenuator knob "off."

10. Set the peak-to-peak/root mean square switch to "P-P." (Only for ASC-802)

11. Attach the J-clip to test point TP2 on the PC board.

    NOTE: Keep the J-clip on TP2 even when testing TP1.

NOTE: Steps 12-15 refer to the test box binding post.

12. Connect a positive (+) signal (2 VAC or 200 mV AC) from the output jack of the signal generator to the red binder post.

13. Connect the positive (+) Multimeter probe to the grey binder post (test point).

14. Connect common from the signal generator to the black (common) binder post.

15. Connect the negative (-) Multimeter probe to the black binder post (common).

General Calibration

IMPORTANT: All calibrated ranges should be within 1% of the given range.

NOTE: Steps 1-6 calibrate the input offset turnpot (R3) on the PC board.

1. Set the test point switch (on the test box) to "TP2."

2. Turn the null switch "on." (on the test box)

3. Set the Multimeter to the lowest DC possible.

4. Adjust R3 for zero (null) DC. (see the Multimeter for the DC reading)

5. Set the attenuator knob to "1" for the ASC-802 or ".1" for the ASC-809.

6. Adjust R3 for zero (null) DC.

NOTE: Steps 7+8 calibrate the output offset turnpot (R4) on the PC board.

7. Set the test point switch (on the test box) to "TP1."

8. Adjust R4 for zero (null) DC.

NOTE: Steps 9-13 calibrate the common mode rejection turnpot (R1) on the PC board.

9. Turn the common mode rejection switch "on." (on the test box)

10. Set the test point switch to "TP2."

11. Attach the oscilloscope probe to the grey binding post on the test box.

12. Set the oscilloscope's volts per division switch to "mV" and its seconds per division switch to "ms."

13. Adjust R1 until the scope's display is as flat as possible. *

* If no scope is available then use the Multimeter as follows:

1. Set the Multimeter to the lowest AC possible.

2. Adjust R1 to the lowest level of the meter reading.

NOTE: Steps 14-20 calibrate the non-inverting (R5) and inverting (R6) input turnpots on the PC board.

14. Set the Multimeter to 20 VAC.

15. Turn the non-inverting switch "on." (on the test box)

    NOTE: The meter reading (voltage at TP2) should equal the 2 VAC or 200 mV AC input.

16. Set the scale switch to "V" per division.

17. Adjust R5 to a 100:1 ratio (10:1 for ASC-809) with the input voltage.

18. Turn the inverting switch "on." (on the test box)

19. Adjust R6 to a 100:1 or 10:1 ratio with the input voltage.

20. Set the scale switch to "mV" per division.

NOTE: The meter reading (voltage at TP2) should still equal the input voltage.

NOTE: Steps 21-24 calibrate the gain adjustment (R18) turnpot on the PC board.

21. Set the attenuator switch on the ASC-802 to "10" or the ASC-809 to "1."

22. Set the test point switch to "TP1."

23. Turn the non-inverting switch "on."

24. Adjust R-18 until the meter reading (voltage at TP1) equals the input.

NOTE: Steps 25-30 calibrate the zero suppression adjustment (R2) turnpot on the PC board.

25. Set the Multimeter to 20 VDC.

26. Turn the null switch "on."

27. Rotate the 10-turn potentiometer on the ASC-802 to "5."

28. Set the polarity switch to "+."

29. Adjust R2 for + 0.5000 volts.

30. Set the polarity switch to "-."

NOTE: R2 should equal - 0.5000 volts.

NOTE: These additional calibration procedures are only required for ASC-802 signal conditioners.

Root Mean Square Setup

1. Set the peak-to-peak/root mean square switch to "RMS."
2. Turn the polarity switch off.
3. Set the Multimeter to the lowest DC range possible.
4. Set the test point switch to "TP1" and place the J-clip on TP2.

NOTE: When the peak-to-peak/root mean square switch is changed from "P-P" to "RMS" TP1 is not the same as pin #8 of the AMJ connector. TP1 becomes pin #6 of the AD536 chip because this pin functions as the output of the RMS converter.

Root Mean Square Calibration

NOTE: Steps 1-3 adjust the root mean square offset for turnpot (R44) on the PC board.

1. Turn the attenuator "off."
2. Turn the null switch "on."
3. Adjust R44 for zero (null).

NOTE: Steps 4-8 adjust the root mean square scale on turnpot (R41).

4. Set the attenuator to "1."
5. Set the scale switch to "mV."
6. Turn the inverting switch "on."

7. Apply 0.050 VDC to the amplifier.

8. Adjust R41 until the output voltage at TP1 equals 0.5 VDC.

NOTE: Steps 9-10 are a RMS AC test.

9. Set the scale switch to "V."

10. Apply 2 VAC at 100 Hz.

NOTE: The output should equal 0.02 VDC.

Notes:

Appendix A: Replaceable Parts

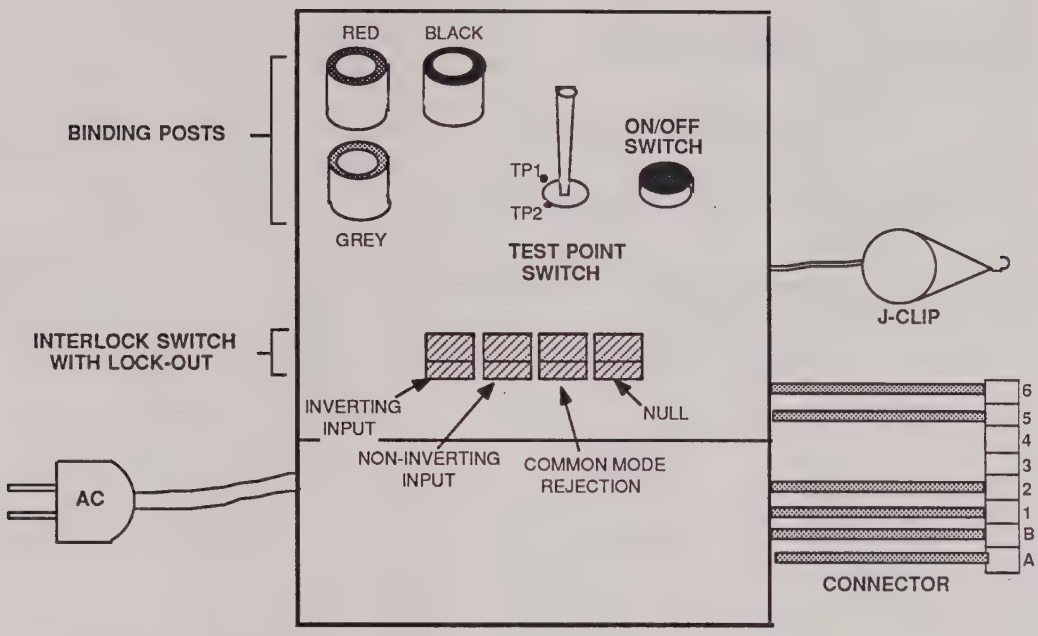
Replaceable Parts

Description	Order #
10-Turn Potentiometer	11655-502
Attenuator Cap	11406-002
Attenuator Knob	11406-004
Attenuator Switch	20072-001
Latch	12060-003
PC Board	30812-002
Peak-to-Peak/ Root Mean Square Switch	21458-000
Polarity Switch	20829-005
Right Side Panel	30928-001
Scale Switch	20073-001
Tubing Shrink	10485-803

Notes:

Appendix B: Drawings

ASC-802/ASC-809 Test Box



Parts

Ref. # Description

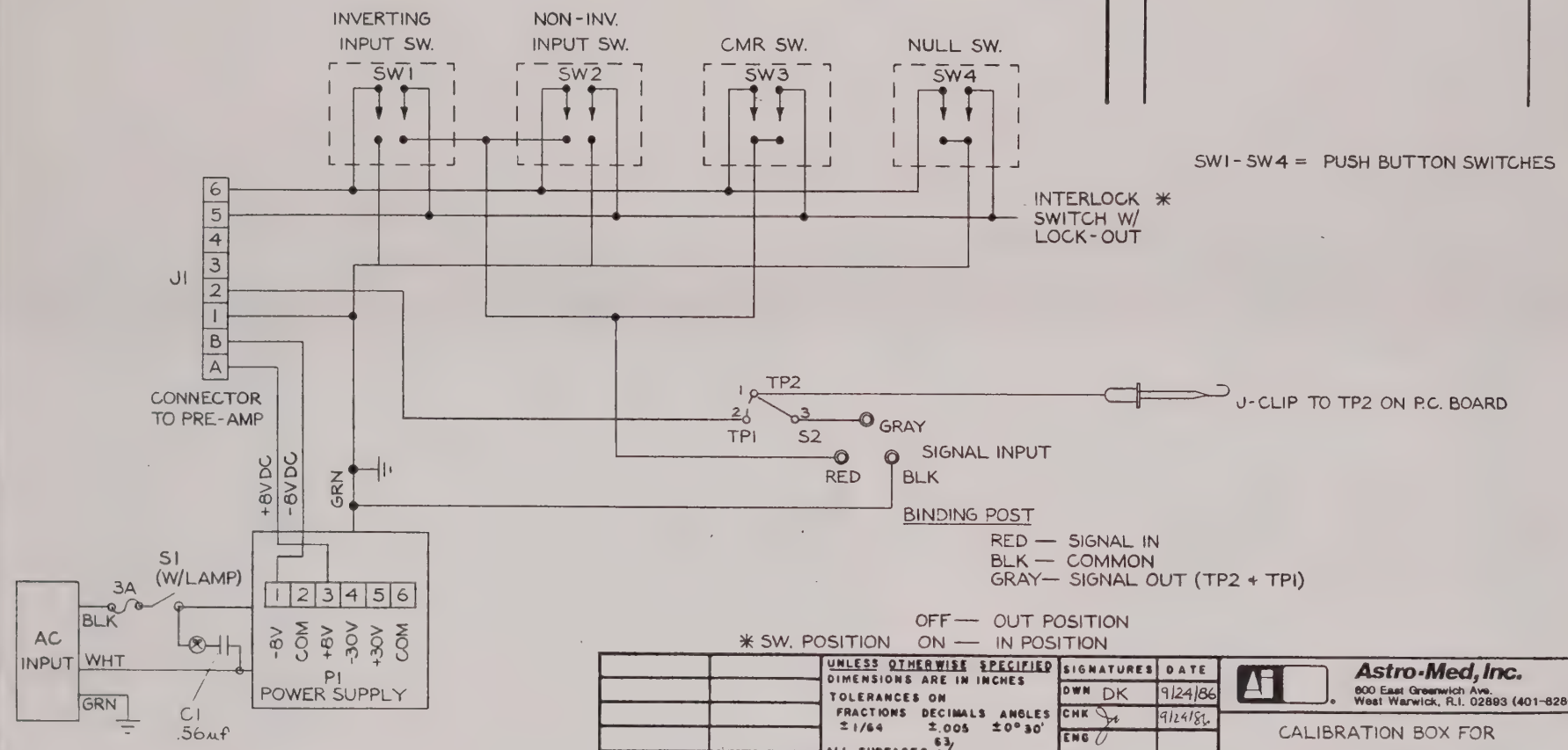
See Drawing # 22451-000

	AC Power Cord and Receptacle
	3A Fuse
	Fuse Holder
S1	Power Switch (with lamp)
C1	Cap (56 microfarad)
P/S	Power Supply (± 8 volts)

Parts Continued..

Ref. #	Description
J1	Connector (516 input)
SW1-SW4	Switch (interlock with lock-out)
S2	Switch (single pole, double throw)
	Binder Post (red)
	" (black)
	" (grey)
	Case
	J-clip

REVISIONS			
CHG LTR	DESCRIPTION	CHG BY & DATE	APP BY & DATE
A			



		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ±1/64 DECIMALS ±.005 ANGLES ±0°30' ALL SURFACES 63 REMOVE BURRS AND SHARP EDGES	SIGNATURES	DATE
			DWN DK	9/24/86
			CHK	9/24/86
			ENG	
			MFG	
		MAT'L-	APP	
NEXT ASSY	USED ON		ISSUED	
APPLICATION		FINISH	SIMILAR TO	
DRAWING LEVEL				

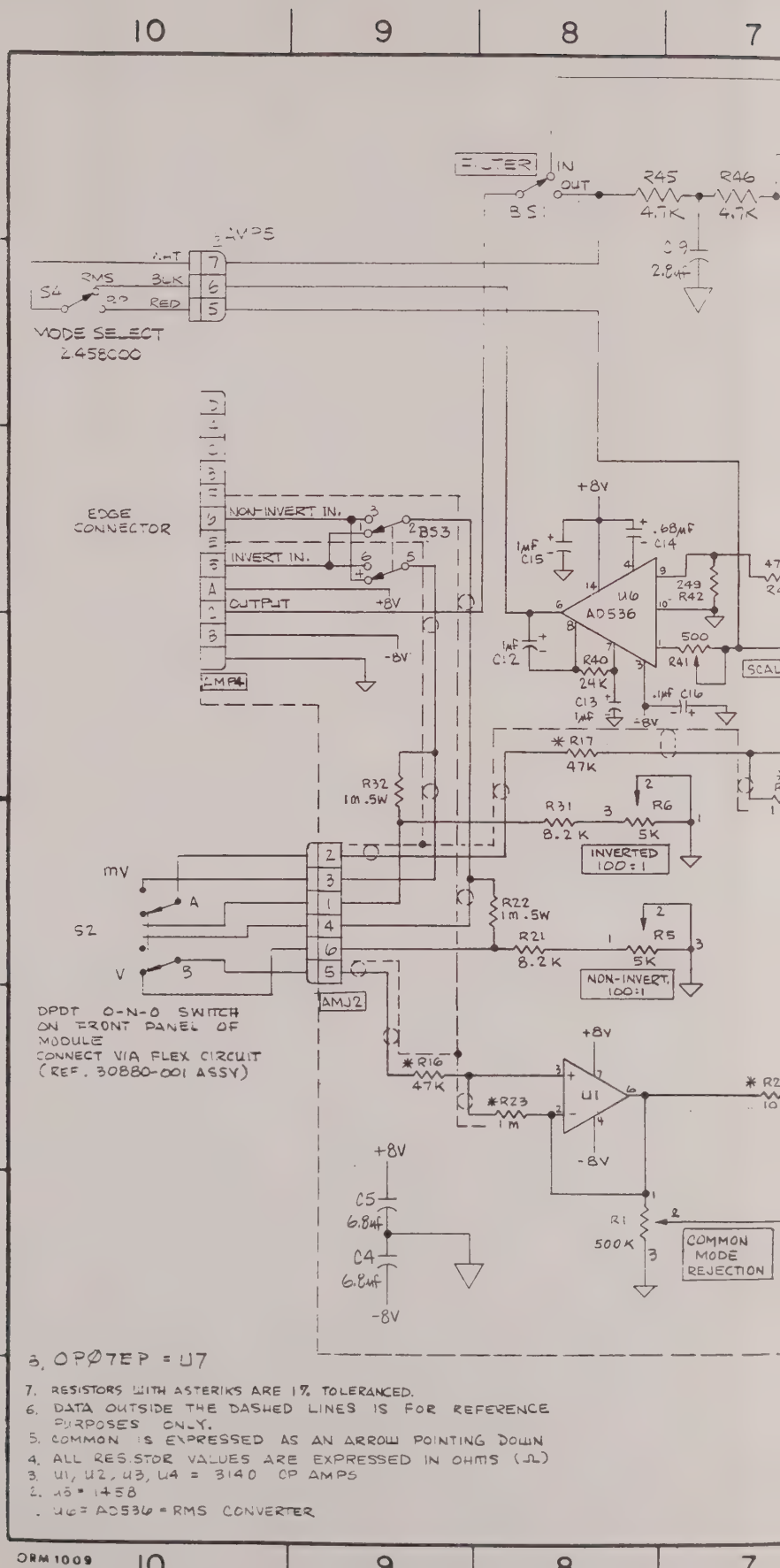
Astro-Med, Inc.
600 East Greenwich Ave.
West Warwick, R.I. 02893 (401-828-4000)

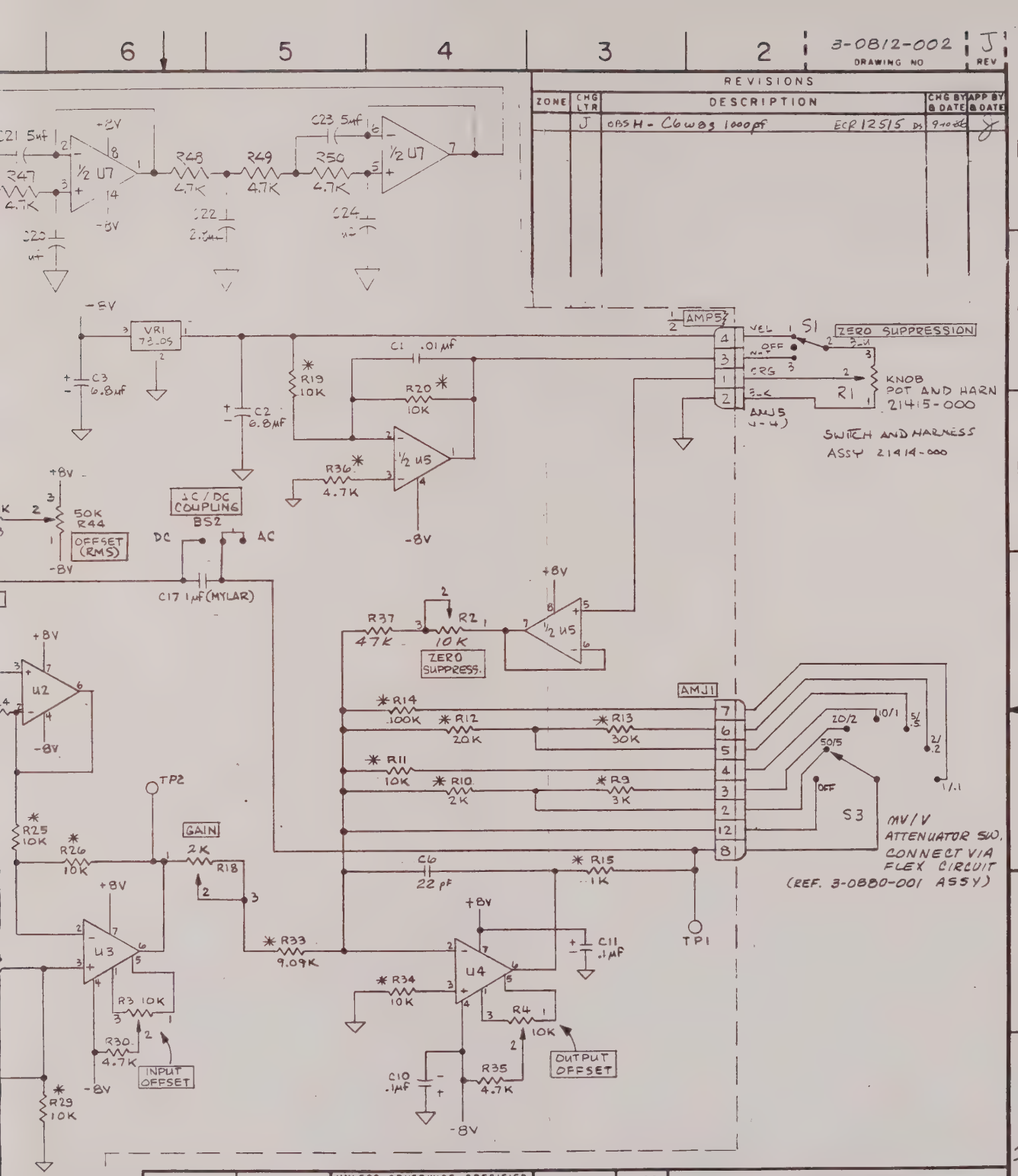
CALIBRATION BOX FOR ASC801, ASC802 AND ASC809

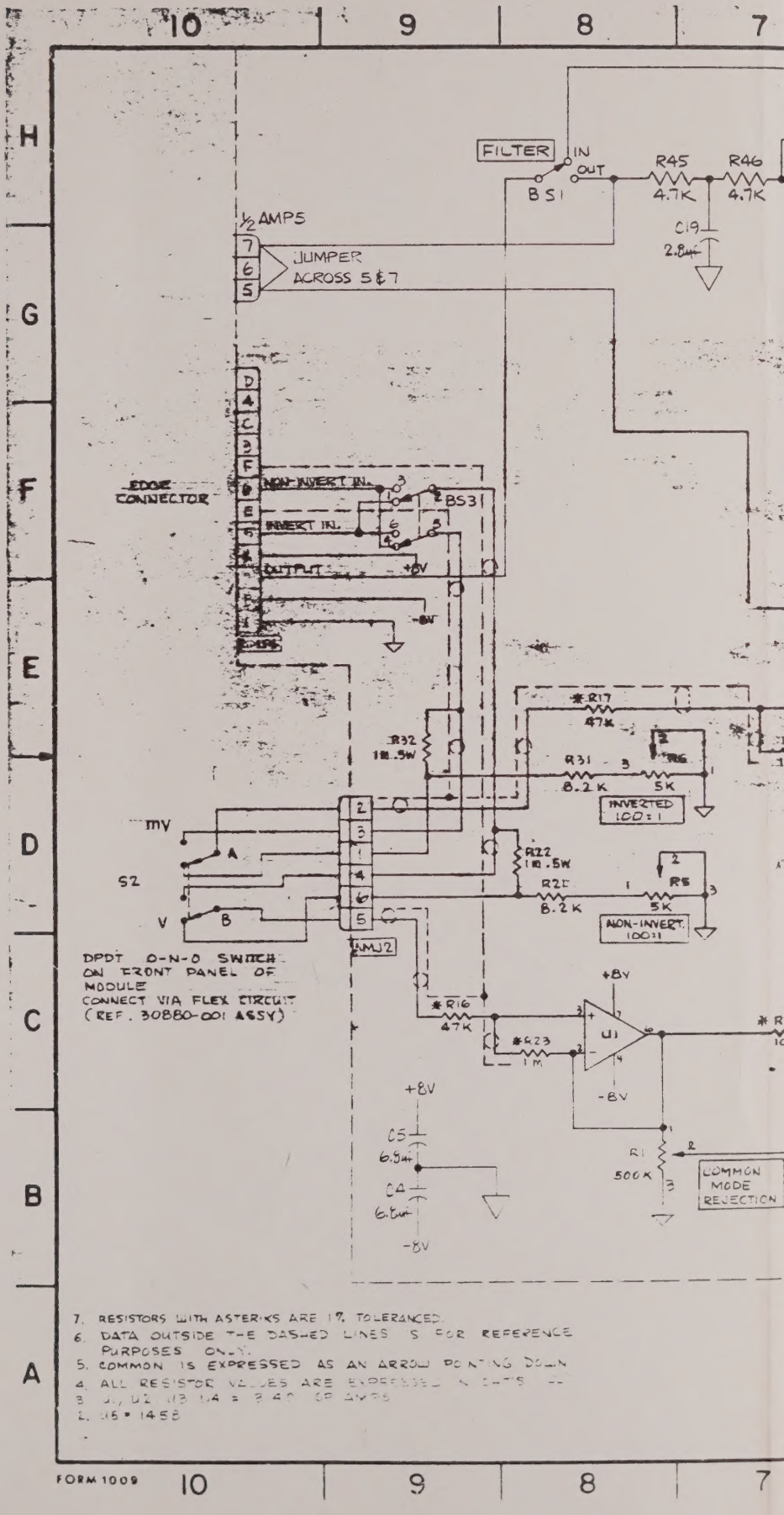
SIZE	CODE IDENT NO.		REV
B		22451-000	A
SCALE		SHEET 1 CONT ON SHEET 2	

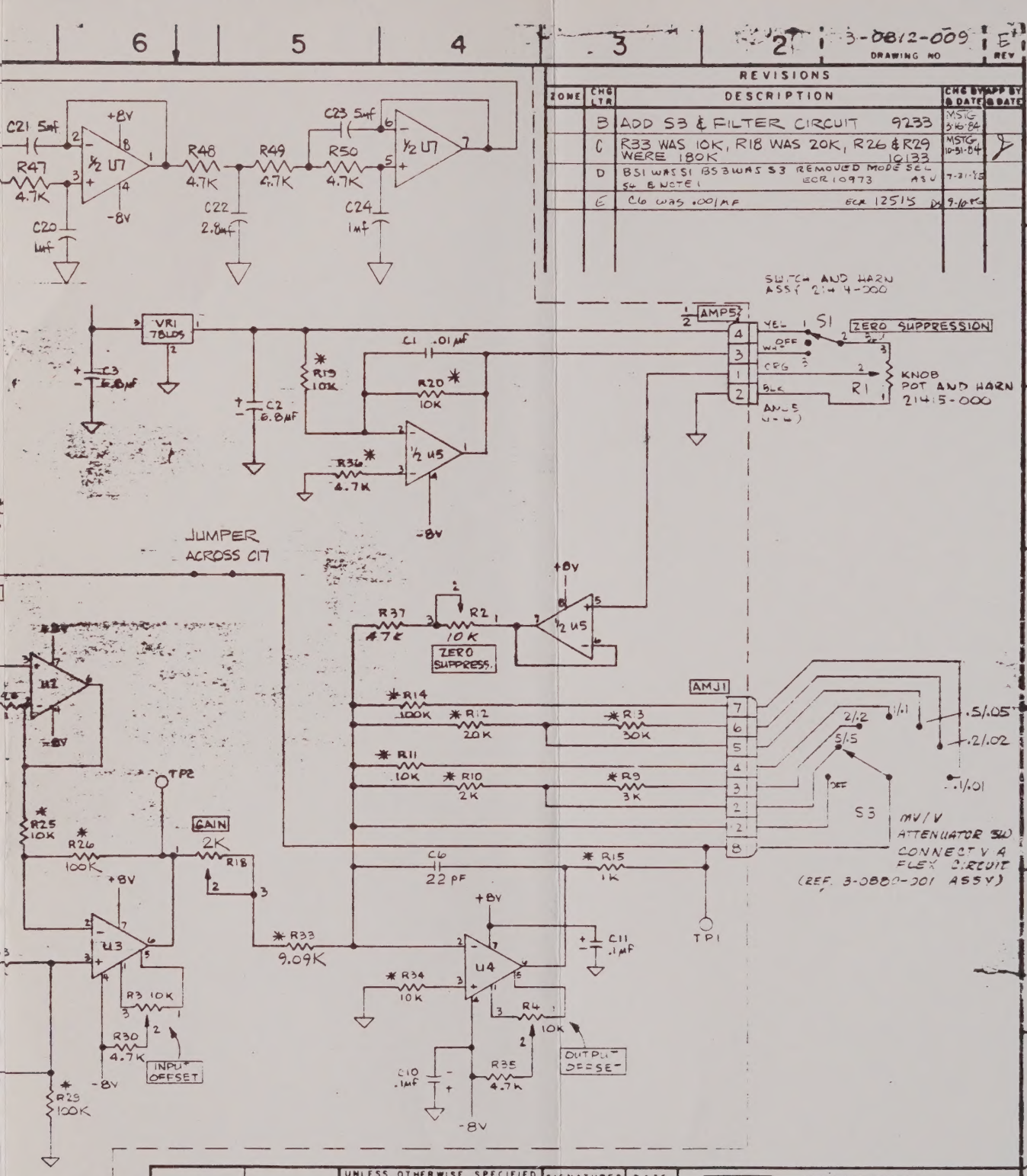
FORM 100F

Rhode Island Blueprint


10
9
8
7
FILTER
IN
OUT
BS1
R45
4.7K
R46
4.7K
C9
2.8uf
AMP5
ANT
RMS
3uK
RED
S4
MODE SELECT
2458000
EDGE CONNECTOR
NON-INVERT IN.
INVERT IN.
OUTPUT
+8V
-8V
BS3
AMP4
+8V
.68uF
C14
1uF
C15
U6
AD536
249
R42
500
R41
1uF
C12
R40
24K
C13
1uF
.1uF C16
-8V
SCAL
*R17
47K
R32
1m .5W
R31
8.2 K
R6
5K
INVERTED
100:1
mV
A
S2
V
B
AMJ2
R22
1m .5W
R21
8.2 K
R5
5K
NON-INVERT.
100:1
DPDT O-N-O SWITCH
ON FRONT PANEL OF
MODULE
CONNECT VIA FLEX CIRCUIT
(REF. 30880-001 ASSY)
*R16
47K
*R23
1m
U1
+8V
-8V
C5
6.8uf
C4
6.8uf
-8V
R1
500K
COMMON
MODE
REJECTION
3, OPØ7EP = U7
7. RESISTORS WITH ASTERIKS ARE 1% TOLERANCED.
6. DATA OUTSIDE THE DASHED LINES IS FOR REFERENCE PURPOSES ONLY.
5. COMMON IS EXPRESSED AS AN ARROW POINTING DOWN
4. ALL RESISTOR VALUES ARE EXPRESSED IN OHMS (Ω)
3. U1, U2, U3, U4 = 3140 OP AMPS
2. U5 = 1458
1. U6 = AD536 = RMS CONVERTER
ORM 1009
10
9
8
7


3-0812-002
DRAWING NO
J
REV
REVISIONS
ZONE
CHG LTR
DESCRIPTION
CHG BY & DATE
APP BY & DATE
J
OBSH - C6 was 1000pf
ECR 12515
+8V
-8V
C21 5uf
C23 5uf
½ U7
R247 4.7K
R248 4.7K
R249 4.7K
R250 4.7K
C22 2.7uf
C24
C20 uf
VR1 78_05
C3 6.8uf
C2 6.8MF
C1 .01 µf
R19 10K
R20 10K
½ U5
R36 4.7K
AMP5
VEL
OFF
CRS
ZERO SUPPRESSION
S1
R1
KNOB POT AND HARN 21415-000
SWITCH AND HARNESS ASSY 21414-000
AMJ5
50K R44
OFFSET (RMS)
AC/DC COUPLING BS2
DC
AC
C17 1µF (MYLAR)
R37 47K
R2 10K
ZERO SUPPRESS.
AMJ1
R14 100K
R12 20K
R13 30K
R11 10K
R10 2K
R9 3K
20/2
10/1
5/.5
2/.2
1/.1
50/5
OFF
S3
MV/V ATTENUATOR SW, CONNECT VIA FLEX CIRCUIT (REF. 3-0880-001 ASSY)
U2
TP2
GAIN
R25 10K
R26 10K
2K
R18
C6 22 pF
R15 1K
TP1
U3
R33 9.09K
U4
C11 .1µF
R34 10K
R3 10K
R30 4.7K
INPUT OFFSET
R4 10K
OUTPUT OFFSET
C10 .1µF
R35 4.7K
R29 10K
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
±1/64 ±.005 ±0°30'
ALL SURFACES 63
REMOVE BURRS AND SHARP EDGES
SIGNATURES
DATE
DWN
CHK
ENG
MFG
APP
ISSUED
9/13/82
ASTRO-MED DIVISION
ATLAN-TOL INDUSTRIES, INC.
SCHEMATIC ASC-2
MEDIUM-GAIN PREAMP WITH RMS
30881-002
ASC-802
NEXT ASSY
USED ON
APPLICATION
DRAWING LEVEL
MAT'L
FINISH
SIMILAR TO 3-0812-001
SIZE C
CODE IDENT NO
3-0812-002
REV J
SCALE
SHEET 2 CONT ON SHEET F


10
9
8
7
H
G
F
E
D
C
B
A
FILTER
IN
OUT
BS1
R45
4.7K
R46
4.7K
C19
2.8μF
½ AMPS
7
6
5
JUMPER
ACROSS 5 & 7
EDGE
CONNECTOR
NON-INVERT IN.
INVERT IN.
OUTPUT
+8V
-8V
BS3
*R17
47K
R32
1M.5W
R31
8.2K
5K
INVERTED
100:1
mV
S2
V
A
B
R22
1M.5W
R21
8.2K
R5
5K
NON-INVERT.
100:1
JMJ2
DPDT O-N-O SWITCH
ON FRONT PANEL OF
MODULE
CONNECT VIA FLEX CIRCUIT
(REF. 30880-001 ASSY)
*R16
47K
*R23
1M
U1
+8V
-8V
C5
6.8μF
C4
6.8μF
R1
500K
COMMON
MODE
REJECTION
7. RESISTORS WITH ASTERIKS ARE 1% TOLERANCED.
6. DATA OUTSIDE THE DASHED LINES IS FOR REFERENCE
PURPOSES ONLY.
5. COMMON IS EXPRESSED AS AN ARROW POINTING DOWN
4. ALL RESISTOR VALUES ARE EXPRESSED IN OHMS
3. U1, U2, U3, U4 = 3140 OR AMP8
2. U5 = 1458
FORM 1009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DRAWING NO
REV
REVISIONS
ZONE | CHG LTR | DESCRIPTION | CHG BY & DATE | APP BY & DATE
B | ADD S3 & FILTER CIRCUIT 9233 | MSTG 3-16-84
C | R33 WAS 10K, R18 WAS 20K, R26 & R29 WERE 180K 10133 | MSTG 10-31-84
D | BS1 WAS S1 BS3 WAS S3 REMOVED MODE SEL S4 & NOTE 1 ECR 10973 | ASV 7-21-85
E | C6 WAS .001MF ECR 12515 | 9-16-85
SWITCH AND HARN ASSY 214-4-000
AMP5
S1
ZERO SUPPRESSION
KNOB POT AND HARN 214-5-000
R1
VR1 7805
C1 .01MF
C2 6.8MF
C3 6.8MF
R19 100K
R20 10K
R36 4.7K
½ U5
-8V
JUMPER ACROSS C17
+8V
R37 47K
R2 10K
ZERO SUPPRESS.
AMJ1
R14 100K
R12 20K
R3 30K
R11 10K
R10 2K
R9 3K
S3
MV/V ATTENUATOR SW
CONNECT VIA FLEX CIRCUIT (REF 3-0800-001 ASSY)
TP2
GAIN
R25 10K
R26 100K
R18 2K
C6 22 PF
R15 1K
TP1
U3
U4
R33 9.09K
C11 .1MF
R34 10K
R4 10K
R3 10K
R30 4.7K
INPUT OFFSET
OUTPUT OFFSET
C10 .1MF
R35 4.7K
R29 100K
C21 5MF
C20 1MF
R47 4.7K
½ U7
R48 4.7K
R49 4.7K
R50 4.7K
C22 2.8MF
C23 5MF
C24 1MF
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
±1/64 ±.005 ±0°30
ALL SURFACES 63
REMOVE BURRS AND SHARP EDGES
MAT'L —
FINISH —
30881009 | ASC-809
NEXT ASSY | USED ON
APPLICATION
DRAWING LEVEL
SIGNATURES | DATE
DWN MSTG 3-16-84
CHK
ENG
MFG
APP
ISSUED
SIMILAR TO 3-0812-001
ASTRO MED DIVISION
ATLANTOL INDUSTRIES, INC.
SCHEMATIC ASC-809
MED HIGH GAIN PREAMP
SIZE C | CODE IDENT NO — | 3-0812-009 | REV E
SCALE — | SHEET 2 CONT ON SHEET 3